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In view of the important bearing of BEER and ARBER'S conclusions upon various cytological and physiological problems, it is to be hoped that future investigations may throw some light upon the following questions:

1. Are BEER and ARBER'S phragmospheres actually hollow spheres of kinoplasm or ring-shaped phragmoplasts such as occur in other tissues of the higher plants?

2. If they are ring-shaped phragmoplasts, as seems probable, do they form cell plates?

3. Are the nuclei of the "binucleate cells" separated by a thin membrane, or does the cell plate disappear without forming a membrane?

4. Do the nuclei of multinucleate cells arise by the same type of nuclear division as the nuclei of binucleate cells?—I. W. BAILEY.

Hepaticae.—Among recent publications on the Hepaticae by EVANS are the following. In continuation of studies of the New England Hepaticae,³ three species of *Nardia* are fully discussed, one of them being described as new. In continuation of the North American Hepaticae,⁴ other species of *Nardia* are considered, also additions to the flora of the United States, extensions of range, and clearing up some difficulties in nomenclature. A taxonomic study of *Dumortiera*⁵ contains a full discussion of the two species as to structure, classification, stations, and literature.

A new *Riccia*⁶ (*R. bistriata*) from Peru presents a noteworthy feature in "the peculiar bands of thickening which are found in the walls of the green cells," a feature which has not before been noted in the Marchantiales. Three species of *Asterella*⁷ from South America are presented as new combinations, transferred from *Fimbriaria*. They are not known to extend into North America; in fact, of the 15 North American species, only two are known to extend into South America.—J. M. C.

Ripening of tomatoes.—SANDO⁸ finds that the maturity of a tomato is dependent upon its age and not upon its size in the growing conditions under which he worked. His analyses show that throughout the ripening period there is an increase in moisture, acids, and sugars, and a decrease in solids, total nitrogen, starch, pentosans, crude fiber, and ash. Sugars increase from

³ EVANS, A. W., Notes on New England Hepaticae. XV. *Rhodora* 21:149-169. pl. 126. figs. 14. 1919.

⁴ ———, Notes on North American Hepaticae. VIII. *Bryologist* 22:54-73. pl. 2. figs. 15. 1919.

⁵ ———, A taxonomic study of *Dumortiera*. *Bull. Torr. Bot. Club* 46:167-182. 1919.

⁶ ———, A new *Riccia* from Peru. *Torreyia* 19:85-88. fig. 1. 1919.

⁷ ———, Three South American species of *Asterella*. *Bull. Torr. Bot. Club* 46:469-480. 1919.

⁸ SANDO, CHAS. E., The process of ripening in the tomato, considered especially from the commercial standpoint. U.S. Dept. Agric., Bull. 859. 1920.